

**REMARKS**

Applicants respectfully request further examination and reconsideration in view of the above amendments and arguments set forth fully below. Claims 1 through 75 and 94 through 109, were previously pending in the instant application. Within the Office Action, Claims 1 through 75 and 94 through 109 have been rejected. By way of the above amendments Claims 1, 3, 4, 5, 9, 13, 17-23, 25, 33, 36,-45, 47-52, 56, 60, 64, 66-72, 94-97, 101, 105, and 109 have been amended. In the prior office action, the status of Claim 61 was unintentionally mislabeled as (Original) when it was in a (Currently amended) state. Accordingly, the present status of Claim 61 is shown as (Previously Presented). Accordingly, Claims 1 through 75 and 94 through 109 are now pending in this application.

**Claim Objections:**

Within the Office Action, Claims 17, 47, 64, and 109 are objected to because each contains a set of alternative limitations which are not written in proper Markush format. Accordingly, Claims 17, 47, 64, and 109 are amended to be in proper claim format.

**Rejections Under 35 U.S.C. § 112**

Within the Office Action, Claims 67 through 71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Accordingly, Claims 67 through 71 are amended to distinctly claim the subject matter which the Applicants regards as their invention.

**Rejections Under 35 U.S.C. § 102(b)**

Within the Office Action, Claims 1-3, 5, 13, 17-19, 21-25, 27-29, 36, 37, 44, 46-50, 52, 66, 67, 71, 72, 74, 75, 94, 95, 97, 105 and 109 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,101,715 to Fuesser *et al.* (hereafter “Fuesser”).

Fuesser discloses a device for a microchannel heat exchanger including one or more heat sources, a micro-channel region 14 or 24 configured to permit fluid flow therethrough; a spreader region or thermal conductor 11 or 21 or 22 comprising a first side and a second side, the first side being coupled to at least one heat source and the second side being coupled to a micro-scaled region 14 or 24 comprising microchannels 13 with walls 15 or microchannels 33 with micro-pillars 35; and a plurality of paths 16 and 17 coupled to the micro-scaled region. Fuesser teaches a fluid flow through the microchannels 13 in a single direction (Fuesser: Fig.1).

Fuesser does not teach a plurality of substantially parallel micro-scaled regions with channels that direct fluid through the micro-scaled regions in opposing directions. Fuesser does not disclose a micro-scaled region that has a micro-porous structure for the fluid path.

The amended independent Claim 1 is directed to a structure with a plurality of substantially parallel micro-scaled regions with inlet channels and outlet channels coupled to the micro-scaled regions such that the cooling fluid in adjacent micro-scaled regions is directed through the micro-scaled regions in substantially opposing directions. In contrast to Fuesser, Fuesser does not disclose a structure with a plurality of micro-scaled regions with inlet and outlet channels couple to the micro-structure such that the fluid flow is in opposing directions. Therefore, Fuesser does not anticipate Claim 1.

The dependent Claims 2-3, 5, 13, 17-19, 21-25, 27-29, 36, 37, 44, and 46-47 depend from base Claim 1 that is now in a condition for allowance. Thus, these claims are allowable as being dependent from an allowable base claim.

The amended independent Claim 48 is directed to a structure with a plurality of substantially parallel micro-scaled regions with inlet channels and outlet channels coupled to the micro-scaled regions such that the cooling fluid in adjacent micro-scaled regions is directed through the micro-scaled regions in substantially opposing directions. As discussed above, Fuesser does not disclose a structure with a plurality of micro-scaled regions with inlet and outlet channels couple to the micro-structure such that the fluid flow is in opposing directions. Therefore, Fuesser does not anticipate Claim 48.

The dependent Claims 49-50, 52, 66, 67, 71, 72, 74, and 75 depend from the allowable base Claim 48. Thus, these claims are allowable as being dependent from an allowable base claim.

The amended independent Claim 94 is directed to a system for fluid cooled micro-scaled heat exchange comprising means for spreading heat having a width and forming a spreader region. The means for spreading heat is coupled to a heat source, a means for supplying fluids, and a means for micro-scaled fluid flow through a plurality of substantially parallel micro-scaled regions that are configured to receive fluid such that the fluid flow of adjacent micro-scaled regions are in opposing directions for adjacent micro-scaled regions where the means for micro-scaled fluid flow is coupled to the means for spreading heat.

As discussed above, Fuesser does not disclose a structure with a plurality of substantially parallel micro-scaled regions with means for fluid flow in opposing directions for adjacent micro-scaled regions. Therefore, Fuesser does not anticipate Claim 94.

The dependent Claims 95, 97, 105, and 109 depend from base Claim 94 that is now in a condition for allowance. Thus, these claims are allowable as being dependent from an allowable base claim.

Within the Office Action, Claims 1-3, 9, 17, 25, 36, 37, 48-50, 56, 64, 66, 67, 72, 94, 95, 101 and 109 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,527,835 to Manginell *et al.* (hereafter “Manginell”).

Manginell discloses a device for preconcentrating a chemical pulled from a vapor 14 with an integrated means for measuring a fluid flow 30 (Abstract). Manginell discloses a single circuitous or serpentine metal heating element (Col. 3, lines 52-56, 13-Fig. 1a). Manginell teaches a membrane 12 to which the heating element 13 is coupled. Manginell teaches away from the membrane 12 operating as a heat-spreader. Manginell teaches that the membrane 12 should be small and thin, which minimizes its heat capacity and reduces thermal conduction to the substrate 11 (Col. 3, line 49-53) which are characteristics that teach away from functioning as a heat spreader. The mode of operation for measuring a fluid flow teaches away from the membrane 12 operating as a heat spreader. All heat that is conducted away from the heat source by modes other than conduction into the channel fluid causes a change in the resistance of the

heat source 13 that is not related to the fluid flow. Thus, non-fluid flow conduction would be considered noise in the fluid flow measurement. Therefore, the operation of Manginell teaches away from spreading the heat but teaches to localize the heat flow to an area over which the fluid flows.

Another difference between Manginell and the Applicant's invention is in the use of a porous material. Manginell discloses a porous material 14 operating as a sorptive material for pulling and absorbing a chemical species of interest from a vapor (Col. 3, lines 41-43). Manginell does not teach using a micro-scaled region that is a micro-porous structure as part of a fluid flow path. In Manginell, there is a microchannel 16-Fig. 1A adjacent to the microporous sorptive material 14-Fig. 1A. Because of the low resistance of the microchannel flow path, the fluid would flow through the microchannel 16 and not through the sorptive material 14-Fig. 1A. Thus, the mode of operation of the sorptive structure in Manginell differs from the Applicant's invention where the micro-porous structure forms the flow path.

Secondly, a sorptive material taught by Manginell teaches away from fluid flowing through the sorptive material. The more that a fluid flows through a sorptive material, the more that absorbed chemical species is flushed from the sorptive material. Thus, the sorptive structure in Manginell teaches away from functioning as a mico-scaled channel. Therefore, Manginell does not teach the use of a micro-porous structure to for the purpose of a fluid flow path but as a sorptive structure for absorbing a chemical species from the fluid flow path.

A further difference between the Applicant's invention and Manginell is that Manginell teaches a fluid flow in one direction through a micro-channel (Manginell: 16-Fig. 1a). Manginell does not disclose a plurality of micro-scaled regions that are substantially parallel where the fluid flow between the adjacent micro-scaled regions are substantially in opposite directions.

The amended independent Claim 1 is directed to a structure with a plurality of substantially parallel micro-scaled regions with inlet channels and outlet channels coupled to the micro-scaled regions such that the cooling fluid is directed through adjacent micro-scaled regions in substantially opposing directions so as to reduce the temperature variance over the heat source. As discussed above, Manginell does not disclose such a structure. Manginell does not teach a heat spreader. Therefore, because Manginell does have all the elements of Claim 1, Manginell does not anticipate Claim 1.

The dependent Claims 2-3, 9, 17, 25, 36, and 37 depend from base Claim 1 that is now in a condition for allowance. Thus, claims 2-3, 9, 17, 25, 36, and 37 are allowable as being dependent from an allowable base claim.

Further, dependent Claims 9 and 17 teach the used of a micro-porous structure as the fluid flow path for the fluid. As discussed above, Manginell teaches away from the use of the sorptive structure as a fluid flow path. For this reason, Manginell does not teach the element of a porous micro-scaled region within the flow path and therefore does not anticipate this element of Claim 9 and 17. For at least this reason, Claims 9 and 17 are allowable over Manginell.

The amended independent Claim 48 is directed to a structure with a plurality of substantially parallel micro-scaled regions with inlet channels and outlet channels coupled to the micro-scaled regions such that the cooling fluid is directed through adjacent micro-scaled regions in substantially opposing directions so as to reduce the temperature variance over the heat source. As discussed above, Manginell does not disclose a structure with a plurality of substantially parallel micro-scaled regions with inlet and outlet channels couple to the micro-structure such that the fluid flow is in substantially opposing directions. Manginell does not disclose a heat spreader. Therefore, because Manginell does have all the elements of Claim 48, Manginell does not anticipate Claim 48.

The dependent Claims 48-50, 56, 64, 66, 67, and 72 depend from the allowable base Claim 48. Thus, these claims are allowable as being dependent from an allowable base claim.

The amended independent Claim 94 is directed to a system for fluid cooled micro-scaled heat exchange comprising means for spreading heat having a width and forming a spreader region. The means for spreading heat is coupled to a heat source, a means for supplying fluids, and a means for micro-scaled fluid flow through a plurality of substantially parallel micro-scaled regions that are configured to receive fluid such that the fluid flow of adjacent micro-scaled regions are in opposing directions for adjacent micro-scaled regions where the means for micro-scaled fluid flow is coupled to the means for spreading heat.

As discussed above, Manginell does not disclose a structure with a plurality of micro-scaled regions with means for fluid flow fluid flow in opposing directions. Further, Manginell does not disclose a heat spreader. Therefore, Manginell does not anticipate Claim 94.

The dependent Claims 95, 101 and 109 depend from base Claim 94 that is now in a condition for allowance. Thus, these claims are allowable as being dependent from an allowable base claim.

**Rejections Under 35 U.S.C. § 103(a)**

Within the Office Action, Claims 4, 6-8, 14-16, 20, 22, 23, 26, 38-43, 45, 51, 53, 61-63, 68-70, 73, 96, 98-100, and 106-108 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,101,715 to Fuesser *et al.*, hereinafter “Fuesser”.

For the reasons argued in above, the independent claims 1, 48, and 94, are in a condition of allowance. Claims 4, 6-8, 14-16, 20, 22, 23, 26, 38-43, and 45, 51, 53, 61-63, 68-70, 73, 96, 98-100, 106-108 are dependent from allowable base claims. Thus, these claims are allowable as being dependent from these allowable base claims.

Within the Office Action, Claims 10-12, 57-59, and 102-104 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,101,715 to Manginell *et al.*, hereinafter “Manginell.”

For the reasons argued in above, the independent claims 1, 48, and 94, are in a condition of allowance. Claims 10-12, 57-59, and 102-104 are dependent from allowable base claims. Thus, these claims are allowable as being dependent from these allowable base claims.

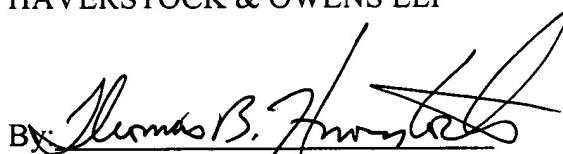
**Double Patenting**

Claims 1-75 and 94-109 are rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over at least claims 1-100 of U.S. Patent No. 7,000,684 to Kenny *et al.* on February 21, 2006. The independent Claims 1, 48, and 94 as modified do not have a coexisting scope with the Claims of Kenny. The independent Claims 1, 48, and 94 include the limitation of a plurality of micro-scaled regions that are substantially parallel and are coupled to the fluid flow such that the fluid flows in a opposing direction to an adjacent micro-scaled region. For this reason, the Double Patenting rejection is no longer applicable.

**PATENT**  
Attorney Docket No.: COOL-00800

For the reasons given above, the Applicants respectfully submit that the Claims 1 through 75 and 94 through 109 are in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,  
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**CERTIFICATE OF MAILING (37 CFR § 1.8(a))**  
I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450

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